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10/631,152	07/31/2003	James F. Elman	86622AEK	2227

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Paul A. Leipold
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER

HON, SOW FUN

ART UNIT

PAPER NUMBER

1772

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,152

Applicant(s)

ELMAN ET AL.

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19,22-31 is/are rejected.
- 7) ☐ Claim(s) 20 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/03, 12/04, 1/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-31 in the reply filed on 11/03/04 is acknowledged.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b). Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-6, 11-13, 17-24, 28, 30-31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6, 8-12, 16, 19, 21-26, 29-30 of copending Application No. 10/431,742. Although the conflicting claims

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are not identical, they are not patentably distinct from each other. Examined claim 1 recites layer A which has an out-of-plane birefringence not more negative than -0.01 which overlaps with the '742 claim 1 recitation of one first layer which has an out-of-plane birefringence not more negative than -0.005 . Examined claim 1 recites amorphous layer B which has an out-of-plane birefringence more negative than -0.01 which overlaps with the '742 claim 1 recitation of one amorphous second layer which has an out-of-plane birefringence more negative than -0.005 . While examined claim 1 recites that the overall in-plane retardation of the multilayer compensator is greater than 20 nm , and the '742 claim recites a range of from $+20$ to -20 nm , the range of examined claim 1 is just an extension of the range of the '742 claim, which is the result of increasing the overall in-plane retardation of the multilayer compensator. An optical compensator compensates for the optical retardation of the optical element. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have increased the overall in-plane retardation range of the multilayer compensator of '742, in order to obtain the desired optical compensation for the liquid crystal cell of the examined application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-19, 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell et al. (US 5,750,641).

Regarding claims 1-2, Ezzell teaches a multilayer compensator (angularity enhancement construction) comprising layer A of Applicant, which is an optically transparent and optically isotropic¹ first layer (substrate) comprising polymeric material (column 2, lines 35-40). Ezzell teaches that the layer comprising polymeric material has zero birefringence¹ in all directions, including out-of-plane (optically isotropic¹), which is within the claimed out-of-plane birefringence range of not more negative than -0.01 . The substrate of Ezzell, which meets the requirements of layer A of Applicant, has at least one contiguous second layer (on at least one surface thereof) (claims 2-3) of polyimide having an out-of-plane birefringence in the range of -0.001 to -0.2 (column 3, lines 30-40), which overlaps the claimed range of more negative than -0.01 . Polyimide is inherently an amorphous polymeric material as defined by Applicant's specification (page 5, lines 20-30). Hence the contiguous second layer of amorphous polyimide meets the requirements of layer B of Applicant. Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm (column 5, lines 50-60), provided by the second polyimide layer, the underlying first layer being optically isotropic (column 2, lines 35-40).

¹ *Merriam-Webster's Collegiate Dictionary, 10th edition, defines the term "isotropic" as exhibiting properties with the same values when measured along axes in all directions, and "birefringence" as the refraction of light in an anisotropic material, wherein the term "anisotropic" is defined as exhibiting properties with different values when measured in different directions.*

Ezzell teaches that it is understood that retardation values are actually negative numbers although we refer to values for retardation in absolute numbers (column 5, lines 50-60). Therefore although Ezzell fails to specify the combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than -20 nm, because Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm, and that it is understood that retardation values are actually negative numbers although we refer to values for retardation in absolute numbers, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided for a combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than -20 nm, in order to obtain the desired overall retardation of the multilayer compensator.

Regarding claim 3, Ezzell teaches that there is one second layer of polyimide, B layer, in the multilayer compensator disposed on at least one surface of the optically isotropic first layer, A layer, (substrate) (column 2, lines 35-40), meaning that the other surface of the first layer A can have another second layer B of polyimide. In this case, all of A layers and B layers are contiguous.

Regarding claims 4-6, Ezzell et al. teaches that each layer B (polyimide second layer) can have a thickness of from about 1 to about 25 micrometers (column 10, lines 40-50) and when combined can have a total thickness of from about 2 to about 20 micrometers (column 10, lines 40-50) which overlaps the claimed range of less than 30 micrometers (claim 4), of from 0.1 to 10

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micrometers (claim 5), of from 1.0 to 10 micrometers (claim 8) and of from 2 to 8 micrometers (claim 6).

Regarding claims 7-10, Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm (column 5, lines 50-60), provided by the second polyimide layer B, the underlying first layer A being optically isotropic (column 2, lines 35-40). Therefore although Ezzell fails to specify the combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm and an overall out-of-plane retardation (R_{th}) of the multilayer compensator of greater than - 20 nm, because Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about 50 nm, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided for isotropic combined layers A, such that a combination of an overall in-plane retardation (R_{in}) of the multilayer compensator of greater than 20 nm (claim 7), of between 30 and 200 nm (claim 8), of between 30 and 150 nm (claim 9), and of between 30 and 100 nm (claim 10), is provided by the combined layers B of polyimide, in order to obtain the desired overall retardation of the multilayer compensator.

Regarding claims 11-13, Ezzell teaches that the isotropic first layer A of the compensator can have a thickness of from about 25 to about 100 micrometers (column 10, lines 35-40) while each polyimide second layer B can have a thickness of from about 1 to about 25 micrometers (column 10, lines 40-50). Therefore the thickness of the combined first A and second B layers of the compensator (lower range end total of $2 + 25 = 27$ micrometers and upper range end total of $20 + 100 = 120$ micrometers) overlaps the claimed range of less than 200 micrometers (claim 11), from 40 to 150 micrometers (claim 12) and from 80 to 110 micrometers (claim 13).

Regarding claims 14-16, Ezzell teaches that the multilayer compensator (angularity enhancement layers) has an off-normal retardation of at least about -50 nm (column 5, lines 50-60), provided by the second polyimide layer B (column 2, lines 35-40). Therefore although Ezzell fails to specify that the combined R_{th} (out-of-plane retardation) of the B layers is -20 nm or more negative, because Ezzell teaches that the off-normal retardation of the multilayer compensator, provided by the second polyimide layer B, is at least about -50 nm, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a combined R_{th} of the B layers within the claimed ranges of more negative than -20 nm (claim 14), from -60 to -600 nm (claim 15) and from -50 to -500 nm (claim 16), in order to obtain the desired retardation for the desired end-use.

Regarding claims 17-18, Ezzell teaches that the Tg of the second layer B of polyimide is 367 °C in Example 2 (column 14, lines 10-15), which is above 180 °C (claim 17). One embodiment is a polyimide layer B coated on a stretched biaxially oriented polymer film, which is layer A of Applicant (column 8, lines 40-45). In order to preserve the stretched biaxially oriented state of layer A, the Tg of the polymer in layer A is preferably at least at the Tg of the second layer B, which is 367 °C (column 14, lines 10-15), which is above 180 °C. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have formed layer A with a polymer wherein the Tg is above 180 °C, in order to preserve the stretched biaxially oriented state of layer A during coating of polyimide layer B onto layer A.

Regarding claim 19, Table 1 of Ezzell (columns 13-14, lines 20-60) shows that the backbone of the polyimide contains carbonyl, imide and aromatic (phenyl) groups. These groups

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are non-visible chromophore groups as defined by Applicant's specification (page 8, lines 10-15).

Regarding claim 22, Ezzell teaches that the first layer A (substrate) can be a triacetyl cellulose (cellulose triacetate) (column 10, lines 30-40), which is provided as a polymer of first layer A provided by Applicant in the specification (page 6, lines 25-30), other than a polymer containing in the backbone a non-visible chromophore group having a Tg above 180 °C.

Regarding claim 23, although Ezzell fails to teach that the second layer polyimide B of the multilayer comprises a polymer containing in the backbone a non-visible chromophore group that does not contain a chromophore off of the backbone, Ezzell teaches that prior art negatively birefringent polyimide films have been made from benzene dianhydrides and monoaromatic diamines (column 1, lines 25-35). Polyimides made from benzene dianhydrides and monoaromatic diamines contain in the backbone the rigid phenyl (benzene) group, which is a non-visible chromophore group as defined by Applicant's specification (page 8, lines 10-15), and no chromophore groups, as defined by Applicant, off the backbone of the polymer. Therefore, because Ezzell teaches that prior art negatively birefringent polyimide films have been made from benzene dianhydrides and monoaromatic diamines, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a polyimide containing in the backbone a non-visible chromophore group that does not contain a chromophore off of the backbone, in place of the polyimide of Ezzell, in order to obtain an alternate multilayer compensator with the desired optical properties.

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Regarding claims 24, 26, Ezzell teaches that the optically isotropic first layer A (substrate) comprises triacetyl cellulose (cellulose triacetate) (column 10, lines 30-40) (claims 24, 26).

Regarding claim 25, Ezzell teaches that first layer A (substrate) can also be a stretched biaxially oriented polymer film such as polycarbonate (column 8, lines 40-45). Polycarbonate is an inherently amorphous polymeric material as defined by Applicant's specification (page 5, lines 20-30). The stretching of a polymer is preferably conducted above its glass transition temperature in order to allow the polymer chains to flow and hence uniformly orient when stretched. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have stretched the polymer film above its glass transition temperature, in order to obtain uniform orientation of the film.

6. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell as applied to claims 1-6, 11-17, 19, 22-26 above, and further in view of Terashita (US 6,512,561).

Ezzell has been discussed above, and teaches that the multilayer compensator is used in a liquid crystal display (column 11, lines 35-45) wherein a pair of polarizers are located one on each side of the liquid crystal cell (column 11, lines 25-35), but fails to teach that the polarizers are crossed.

Terashita has a multilayer (plurality of laminated films) compensator (column 10, lines 40-45) whereby one or more first layers (supporting substrate) is coated with one or more second layers having birefringence (index anisotropy) in order to obtain a negative retardation which is out-of-plane (in a direction normal to the substrate) (column 10, lines 40-50). The first and second layers A, B, are therefore contiguous, and the first layer A (supporting substrate) has no

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birefringence, or an out-of-plane birefringence of 0, which is within the claimed range of not more negative than -0.005 .

Regarding claim 27, Terashita teaches that the multilayer compensator is used in a liquid crystal display, with a pair of polarizers, one on each side of (sandwiches) the liquid crystal cell (abstract). The polarizers are crossed (column 3, lines 15-20) in a crossed-Nichols arrangement.

Terashita demonstrates that a crossed pair of polarizers, one on each side of the liquid crystal cell is well known in the art at the time the invention was made. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have crossed the pair of polarizers on both sides of the liquid crystal cell of Ezzell, in order to obtain the desired polarized optics for the liquid crystal display of Ezzell.

Regarding claim 28, Ezzell teaches a twisted nematic liquid crystal cell (column 11, lines 30-35).

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell in view of Terashita as applied to claims 27-28 above, and further in view of Matsuoka et al. (US 6,630,973).

Ezzell in view of Terashita has been discussed above. Ezzell teaches a liquid crystal display which employs a twisted nematic liquid crystal cell (column 1, lines 30-35), but fails to teach an optically compensated bend liquid crystal cell.

Matsuoka teaches that liquid crystal cell types include twisted nematic, vertically aligned, and optically compensatory bend, which are equivalent in terms of providing for the transmission type of liquid crystal display (column 1, lines 20-35).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have employed an optically compensated bend liquid crystal cell in place of the twisted nematic liquid crystal cell in the liquid crystal display of Matsuoka, in order to obtain a transmission liquid crystal display with the desired optical compensation.

8. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezzell as applied to claims 1-19, 22-26 above, and further in view of Matsuoka et al. (US 6,630,973).

Ezzell has been discussed above, and teaches a liquid crystal cell, at least one polarizer, and at least one compensator from claim 1.

Regarding claim 30, Ezzell fails to teach a reflective plate.

Matsuoka teaches that a liquid crystal display of reflection type comprises a polarizer (polarizing element), a reflective plate (reflection board), and a compensator (optical compensatory sheet) (column 1, lines 15-25).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have placed a reflective plate in the liquid crystal display of Ezzell, in order to obtain a reflection-type liquid crystal display, as taught by Matsuoka.

Regarding claim 31, Ezzell teaches a twisted nematic liquid crystal cell, but fails to teach that it is also vertically aligned.

Matsuoka teaches that examples of reflection type liquid crystal display cells (modes) include twisted nematic (TN), and hybrid aligned cells, which comprise vertically aligned twisted nematic cells (column 1, lines 28-35).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a vertically aligned twisted nematic cell in place of the

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twisted nematic cell of Ezzell, in order to obtain a hybrid aligned reflection type liquid crystal display, as taught by Matsuoka.

Allowable Subject Matter

9. Claims 20-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The cited prior art of record, US 5,720,641 fails to teach, even in combination with US 6,628,359, a multilayer compensator for an LC cell comprising one or more first layers having an out-of-plane birefringence not more negative than -0.005 and one or more second layers having an out-of-plane birefringence more negative than -0.005, wherein the layers are amorphous and comprise selected polymeric materials having sufficient thickness so that the overall in-plane retardation (R_e) of the compensator is from +20 to -20nm and the out-of-plane retardation (R_{th}) of at least one of the one or more second layers is more negative than -20nm, which polymeric materials of the one or more second layers is selected from the group consisting of poly(4,4'-hexafluoroisopropylidene-bisphenol) terephthalate-co-isophthalate, poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene bisphenol) terephthalate, poly(4,4'-isopropylidene-2,2',6,6'-tetrachlorobisphenol) terephthalate-co-isophthalate, poly(4,4'-hexafluoroisopropylidene)-bisphenol-co-(2-norbornylidene)-bisphenol terephthalate, poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene)-bisphenol-co-(4,4'-isopropylidene-2,2',6,6'-tetrabromo)-bisphenol terephthalate, and poly(4,4'-isopropylidene-bisphenol-co-4,4'-(2-norbornylidene)-bisphenol) terephthalate-co-isophthalate or copolymers of any of the foregoing.

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Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

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Harold Pyon

HAROLD PYON
SUPERVISORY PATENT EXAMINER

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